UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/534,695	05/13/2005	Masashi Nakamura	1592-0155PUS1	8694

2292 7590 04/30/2007
BIRCH STEWART KOLASCH & BIRCH
PO BOX 747
FALLS CHURCH, VA 22040-0747

EXAMINER	
HARRISON, MONICA D	
ART UNIT	PAPER NUMBER
2813	

SHORTENED STATUTORY PERIOD OF RESPONSE	NOTIFICATION DATE	DELIVERY MODE
3 MONTHS	04/30/2007	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Notice of this Office communication was sent electronically on the above-indicated "Notification Date" and has a shortened statutory period for reply of 3 MONTHS from 04/30/2007.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mailroom@bskb.com

Office Action Summary	Application No.	Applicant(s)	
	10/534,695	NAKAMURA ET AL.	
	Examiner	Art Unit	
	Monica D. Harrison	2813	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *08 November 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *10-27* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *10-27* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. Applicant's arguments and remarks filed 11/8/06 have been entered.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 10-27 are rejected under 35 U.S.C. 102(b) as being anticipated by Oida et al (5,647,917).

2. Regarding claim 10, Oida et al discloses an epitaxial growth method comprising: supporting a substrate for growth with a substrate supporter (Figure 2, support is the lower substrate), forming a compound semiconductor layer comprising 3 or 4 elements on the substrate (Figure 2) for growth by metal organic chemical vapor deposition (column 1, lines 27-34), polishing the substrate (column 5, line 44) so that an angle of gradient is 0.000 to 0.030 or 0.040 to 0.100 with respect to (100) direction in an entire effective area of the substrate (column 6, lines 52-67 thru column 7, lines 1-40), and forming the compound semiconductor layer to be 0.5 μm thick or more on the substrate by using the substrate for growth (Figure 2).

3. Regarding claim 11, Oida et al discloses forming a buffer layer on the substrate for growth, and forming the compound semiconductor layer on the buffer layer (Figure 2, *InP)*.

4. Regarding claim 12, Oida et al discloses wherein the compound semiconductor layer is a III-V group compound semiconductor layer containing at least As (Figure 2, *InGaAs*).

5. Regarding claim 13, Oida et al discloses wherein the compound semiconductor layer is a III-V group compound semiconductor layer containing at least As (Figure 2, *InGaAs*).

6. Regarding claim 14, Oida et al discloses wherein the compound semiconductor layer is an InGaAs layer or an lnAlAs layer (Figure 2, *InGaAs)*.

7. Regarding claim 15, Oida et al discloses wherein the compound semiconductor layer is an InGaAs layer or an InAlAs layer (Figure 2, *InGaAs)*.

8. Regarding claim 16, Oida et al discloses wherein the substrate for growth is a semiconductor crystal substrate having dislocation density of $5000cm^{-2}$ or less (column 6, lines 52-67 thru column 7, lines 1-40).

9. Regarding claim 17, Oida et al discloses wherein the substrate for growth is a semiconductor crystal substrate having dislocation density of $5000cm^{-2}$ or less (column 6, lines 52-67 thru column 7, lines 1-40).

10. Regarding claim 18, Oida et al discloses wherein the substrate for growth is a semiconductor crystal substrate having dislocation density of $5000cm^{-2}$ or less (column 6, lines 52-67 thru column 7, lines 1-40).

11. Regarding claim 19, Oida et al discloses wherein the substrate for growth is a semiconductor crystal substrate having dislocation density of $5000cm^{-2}$ or less (column 6, lines 52-67 thru column 7, lines 1-40).

12. Regarding claim 20, Oida et al discloses wherein the substrate for growth is an InP substrate (Figure 2, *InP*).

13. Regarding claim 21, Oida et al discloses wherein the substrate for growth is an InP substrate (Figure 2, *InP*).

14. Regarding claim 22, Oida et al discloses wherein the substrate for growth is an InP substrate (Figure 2, *InP*).

15. Regarding claim 23, Oida et al discloses wherein the substrate for growth is an InP substrate (Figure 2, *InP*).

16. Regarding claim 24, Oida et al discloses a substrate for epitaxial growth used for an epitaxial growth method in which a compound semiconductor layer comprising 3 or 4 elements is formed on the substrate for growth (Figure 2) by metal organic chemical vapor deposition (column 1, lines 27-34), wherein an angle of gradient is 0.000 to 0.030 or 0.040 to 0.100 with respect to (100) direction in an entire effective area of the substrate (column 6, lines 52-67 thru column 7, lines 1-40).

17. Regarding claim 25, Oida et al discloses wherein the substrate is a semiconductor crystal substrate having dislocation density of $5000cm^{-2}$ or less (column 6, lines 52-67 thru column 7, lines 1-40).

18. Regarding claim 26, Oida et al discloses wherein the substrate is an InP substrate (Figure 2, *InP*).

19. Regarding claim 27, Oida et al discloses wherein the substrate is an InP substrate (Figure 2, *InP).*

Response to Arguments

20. Applicant's arguments filed 11/8/06 have been fully considered but they are not persuasive. Applicant states that Oida '917 does not explicitly or implicitly disclose that the compound semiconductor layer is formed to a thickness of 0.5μm or more. Examiner disagrees. In column 7, lines 1-36, Oida et al discloses an InP layer (compound semiconductor layer)

epitaxially formed at a growth rate of 0.05μm/hr and 20 μm/hr. 0.5μm or more falls within this range. To say Oida '917 is not concerned with the problem of aberrant surface morphology which occurs when the compound semiconductor layer is formed to be 0.5μm thick or more, *aberrant surface morphology* is not within the claimed subject matter therefor, it is not considered. Applicant also states Oida '917 fails to disclose or suggest the use of a substrate not having a certain plane orientation in the entire area of the substrate, specifically, between 0.03° and 0.04°, also is not in the claimed subject matter. The angle of gradient is 0.00° to 0.03° or 0.04° to 0.10° as claimed. Plane orientation is found within column 7, lines 1-52.

Conclusion

21. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Monica D. Harrison whose telephone number is 571-272-1959. The examiner can normally be reached on M-F 7:00am-3:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Whitehead Jr. can be reached on 571-272-1702. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Monica D. Harrison
AU 2813

mdh
April 17, 2007

CARL WHITEHEAD, JR.
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800